

NICOTINE: COTININE LEVELS IN BLOOD DURING CESSATION OF SMOKING

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PURPOSE: "THE ROLE OF NICOTINE AS A PRIMARY REINFORCER AND OF NICOTINE WITHDRAWAL AS A FACTOR IN MAINTAINING CIGARETTE SMOKING BEHAVIOR HAS BEEN RECENTLY REVIEWED." IN ORDER TO DETERMINE IF SERUM COTININE (THE MAJOR NICOTINE METABOLITE) CAN BE USED AS A VALID INDEX OF SMOKING BEHAVIOR AND "CHRONIC NICOTINISM," THIS PAPER INVESTIGATES THE RELATIONSHIP BETWEEN SMOKERS' SERUM COTININE LEVELS, THEIR ABILITY TO QUIT SMOKING, AND THEIR SMOKING HABITS PRIOR TO CESSATION.

METHODS: SMOKING BEHAVIOR WAS MONITORED IN 10 MEN AND 20 WOMEN WHO PARTICIPATED IN A SMOKING CESSATION PROGRAM WHICH CONSISTED OF 4 WEEKS OF VOLUNTARY, GRADUAL WITHDRAWAL, A "CUTOFF DAY" ON WHICH ALL PARTICIPANTS WERE EXPECTED TO CEASE SMOKING, AND THEN 4 WEEKS OF FOLLOW-UP DISCUSSIONS. SERUM COTININE WAS DETERMINED AT THE INITIAL MEETING (I.E., "PRETREATMENT" COTININE), AT THE CUTOFF DAY, AND AT THE END OF THE PROGRAM. THE DEGREE OF DIFFICULTY SUBJECTS EXPERIENCED IN ATTEMPTING TO QUIT, AS WELL AS THEIR SMOKING HABITS PRIOR TO BEGINNING THE PROGRAM WERE DETERMINED. THE RELATIONSHIP BETWEEN SERUM COTININE, SUCCESS IN QUITTING, PERCEIVED DIFFICULTY IN QUITTING, AND PRIOR SMOKING HABIT, WAS ASSESSED. IN ADDITION, THE RELATIONSHIP BETWEEN SMOKING BEHAVIOR AND PLASMA DOPAMINE-BETA-HYDROXYLASE (DBH), AN INDEX OF SYMPATHETIC ACTIVITY, WAS DETERMINED.

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FINDINGS: BY THE END OF THE PROGRAM 6 MEN AND 14 WOMEN HAD GRADUATED, I.E., ACHIEVED ABSTINENCE. FIVE MONTHS LATER, FIVE MEN AND EIGHT WOMEN REMAINED ABSTINENT, AND 11 MO LATER FOUR MEN AND EIGHT WOMEN REMAINED ABSTINENT. THERE WAS NEARLY A 20-FOLD VARIATION IN PRETREATMENT SERUM COTININE LEVELS BETWEEN DIFFERENT INDIVIDUALS. IN ALL BUT TWO INDIVIDUALS COTININE LEVELS MEASURED AT CUTOFF DAY WERE MARKEDLY LESS THAN PRETREATMENT VALUES.

MALE GRADUATES HAD SIGNIFICANTLY LOWER PRETREATMENT COTININE LEVELS THAN MALE NONGRADUATES, AND THIS DIFFERENCE WAS EVEN GREATER BY CUTOFF DAY. FEMALE GRADUATES STARTED OUT WITH HIGHER BLOOD COTININE LEVELS THAN FEMALE NONGRADUATES, BUT BOTH GROUPS HAD ABOUT THE SAME LEVELS AT CUTOFF DAY.

IN MALES, PRETREATMENT AND CUTOFF COTININE LEVELS WERE POSITIVELY CORRELATED WITH THE NUMBER OF CIGARETTES SMOKED PER DAY PRIOR TO TREATMENT, WITH THE NICOTINE INTAKE FROM THESE CIGARETTES, AND WITH THE DEGREE OF DIFFICULTY IN QUITTING. THE TOTAL DAILY NICOTINE INTAKE (BUT NOT THE NUMBER OF CIGARETTES) WAS POSITIVELY CORRELATED WITH THE DEGREE OF DIFFICULTY IN QUITTING. IN FEMALES, THE DEGREE OF DIFFICULTY IN QUITTING SHOWED NO SIGNIFICANT RELATIONSHIP TO ANY OTHER VARIABLES (E.G., COTININE, NICOTINE INTAKE, SMOKING HABITS). THERE WAS NO SIGNIFICANT CHANGE IN DBH BETWEEN THE PRE- AND POSTTREATMENT DETERMINATIONS.

DISCUSSION: THESE RESULTS HAVE SHOWN THAT "HIGHER INITIAL COTININE LEVELS WERE ASSOCIATED WITH FAILURE TO STOP SMOKING IN MEN. WITH FEMALES HIGH INITIAL LEVEL OF BLOOD COTININE DID NOT APPEAR TO HAVE A PREDICTIVE FUNCTION RELATIVE TO SUCCESS OR FAILURE IN SMOKING CESSATION.... IT IS POSSIBLE, THEREFORE, THAT THIS FEMALE GROUP DID NOT EXPERIENCE PHYSIOLOGIC ADDICTIVE FACTORS TO THE SAME DEGREE AS THE MALES AND THAT OTHER VARIABLES, SUCH AS THE HABIT-TYPE FACTORS... WERE MORE RELATED TO THE CESSATION EXPERIENCE....

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"SERUM COTININE DETERMINATIONS OFFER A METHOD OF VERIFYING SMOKERS' TESTIMONY REGARDING INITIAL SMOKING CESSATION AND LONG-RANGE ABSTINENCE....THE AVAILABILITY OF A RAPID AND SENSITIVE ASSAY FOR SERUM COTININE OPENS UP THE POSSIBILITY OF A WIDE RANGE OF EXPERIMENTS ON THE RELATIVE ROLES OF NICOTINE AND PSYCHOLOGIC FACTORS IN COMPULSIVE CIGARETTE SMOKING....

"THE RESULT OBTAINED IN OUR STUDIES WITH DBH SUGGEST THAT SMOKING DOES NOT MODIFY SYMPATHETIC NOREPINEPHRINE RELEASE IN HUMANS OR THAT PLASMA DBH ACTIVITY IS NOT A SENSITIVE ENOUGH INDICATOR TO MONITOR SMOKING-INDUCED CHANGES IN SYMPATHETIC ACTIVITY."

/JS/

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BRAND U, WALTHAM, MASS

ENZYMES STUDY, BEHAVIOR STUDY, METHODOLOGY STUDY, PROSPECTIVE STUDY, SEROLOGICAL STUDY, MALE FEMALE DATA, CIGARETTE SMOKING, EXSMOKERS, BLOOD COTININE CONTENT, SMOKING DISCONTINUATION METHODS, SMOKING DISCONTINUATION PROGRAMS, ANTISMOKING PROGRAMS EFFECTIVENESS, SMOKING HABITS CHANGES, SMOKING HABITUATION, SMOKING ADDICTION, BLOOD COTININE SMOKING ASSOC, CIGARETTE SMOKE NICOTINE, SMOKING DISCONTINUATION PREDICTION, NICOTINE METABOLITES/ NICOTINE METABOLISM, BLOOD NICOTINE, COTININE METABOLISM, DATA COMPARABILITY, SMOKING DISCONTINUATION GROUPS, ANTISMOKING CLINICS, NICOTINE HABITUATION, NICOTINE ADDICTION, SMOKING REDUCTION, BLOOD DOPAMINE BETA HYDROXYLASE, TIME FACTORS, NICOTINE WITHDRAWAL, SMOKING DISCONTINUATION SEX FACTORS NONASSOC, SMOKING DISCONTINUATION DURATION, INDIVIDUAL VARIABILITY HI, SMOKING METHODS, SMOKING INHALATION HABITS, SMOKING INHALATION DEGREE, PUFF PATTERNS, PUFF FREQUENCY, SMOKING WITHDRAWAL SYMPTOMS, NICOTINE DOSE, SELF REGULATION, NICOTINE ABSORPTION, SMOKING BEHAVIOR PATTERNS,

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SMOKING CONTINUATION, SMOKING RESUMPTION, POPULATION SAMPLE
SIZE CONCESSION, INTERPRETATION VALIDITY CONCESSION, SMOKING
DISCONTINUATION SMOKING AMOUNT NONASSOC, SMOKING DISCONTINUATION
SMOKING HABITS ASSOC, SMOKING DISCONTINUATION SMOKING
DURATION NONASSOC, SMOKING PHYSIOLOGICAL FACTORS CAUSATION 2,
SEX FACTORS HI, SMOKING ADDICTION HI, SMOKING HABITUATION HI,
SMOKING HISTORY VALIDITY CONCESSION, DOPAMINE, SYMPATHETIC
NERVOUS SYSTEM, ADRENAL MEDULLA, NOREPINEPHRINE RELEASE SMOKING
NONASSOC, CATECHOLAMINE RELEASE SMOKING NONASSOC, SMOKING
NEUROLOGICAL EFFECTS HI, SMOKING PHYSIOLOGICAL EFFECTS HI,
SERUM ENZYMES SMOKING NONASSOC, STRESS FACTORS, METHODOLOGY
ANALYSIS, METHODOLOGY VALIDITY, SMOKING PSYCHOLOGICAL FACTORS
CAUSATION 2, CATECHOLAMINE RELEASE SMOKING CAUSATION 2/
LOW NICOTINE CIGARETTES, STATISTICAL ANALYSIS, BLOOD ANALYSIS,
SMOKING HABITS QUESTIONNAIRE, SMOKING HISTORY QUESTIONNAIRE,
SMOKING DISCONTINUATION SEX FACTORS CAUSATION 3, SMOKING
DISCONTINUATION SEX FACTORS CAUSATION 1/
ENGLISH LANGUAGE, NEW YORK NY RESIDENCE, WALTHAM MASS RESIDENCE,
USA RESIDENCE, GRANTOR USPHS NATL INST ALLERGY INFECTIOUS DIS,
GRANTOR USPHS NATL INST MENTAL HEALTH, GRANTOR USPHS GEN RES
SUPPORT, GRANTOR USPHS NATL CANCER INST, HOSPITAL WORKERS OCCUPATION